


The Biological Deserts Fallacy

Cities contribute more than we think to regional biodiversity



Erica Spotswood, PhD
Cal-IPC
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At Second Nature, we fill a void in **systematic, science-based design** of cities to deliver the biodiversity, resilience, health, and experiential **benefits we need from nature.**

Team



Robin Grossinger

Principal
ecological vision and strategy



Erica Spotswood, PhD

Senior Ecologist
health-ecology linkages,
monitoring+analysis, research design



Micaela Bazo

Strategy Director
landscape architecture, urban planning,
urban design



Kate Malmgren

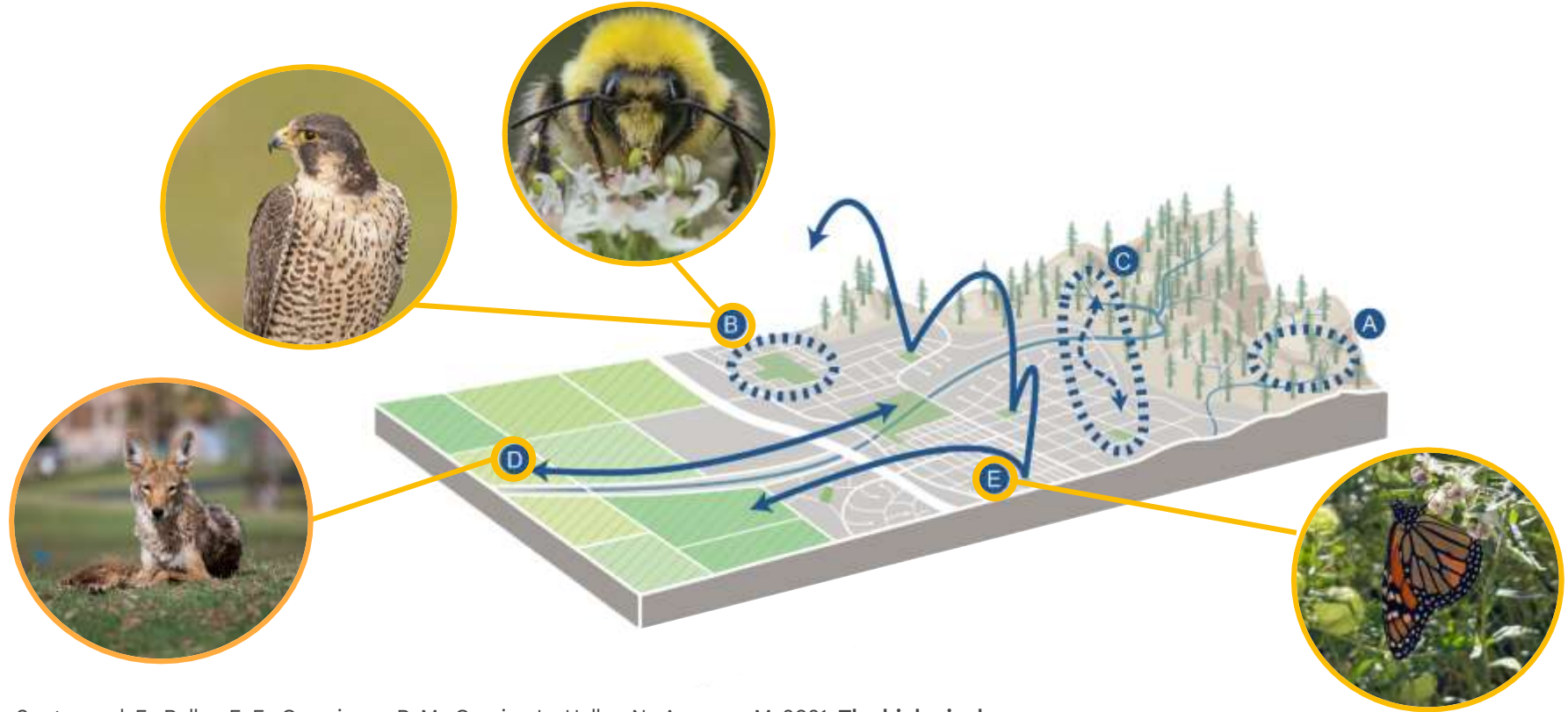
Senior Sustainability Associate
corporate sustainability, biophilic design,
urban redevelopment



Megan Wheeler, PhD

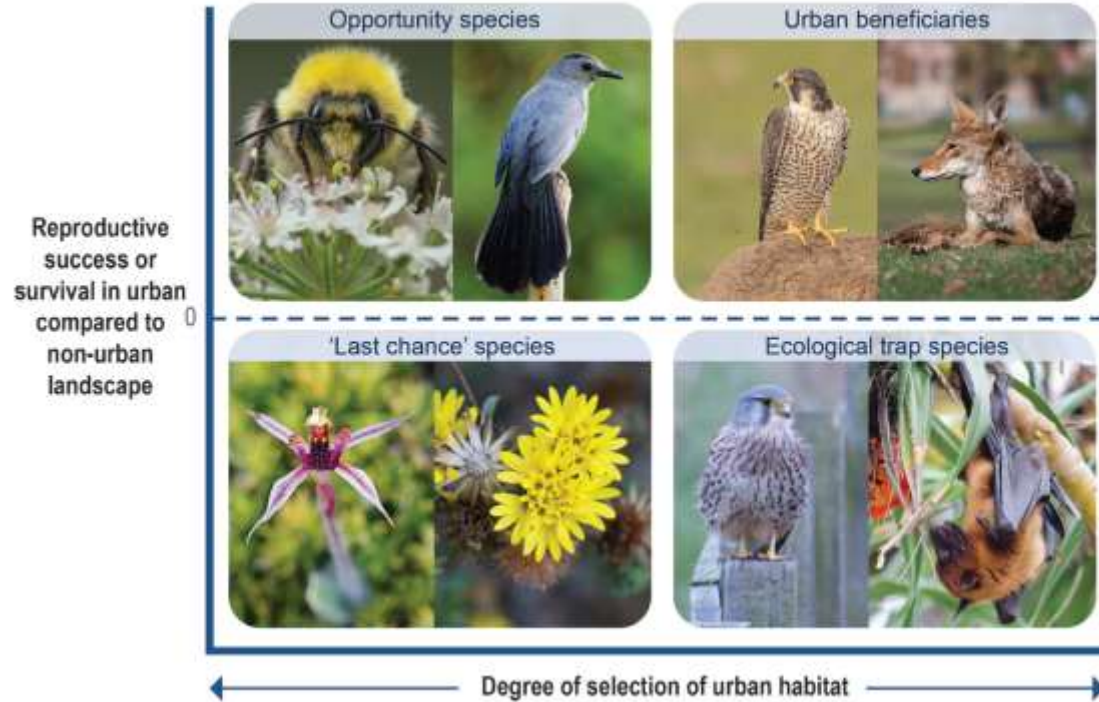
Science Director
science-based metrics+targets, integrated
heat-health-biodiversity

Cities contribute more than we think to biodiversity



Spotswood, E.; Beller, E. E.; Grossinger, R. M.; Grenier, L.; Heller, N.; Aronson, M. 2021. **The biological deserts fallacy: Cities in their landscapes contribute more than we think to regional biodiversity.** BioScience 71 (2).

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Cities contribute more than we think to biodiversity



1. Release from pressure in surrounding landscape



1. Increase regional habitat heterogeneity



1. Provide stopover locations for migratory species



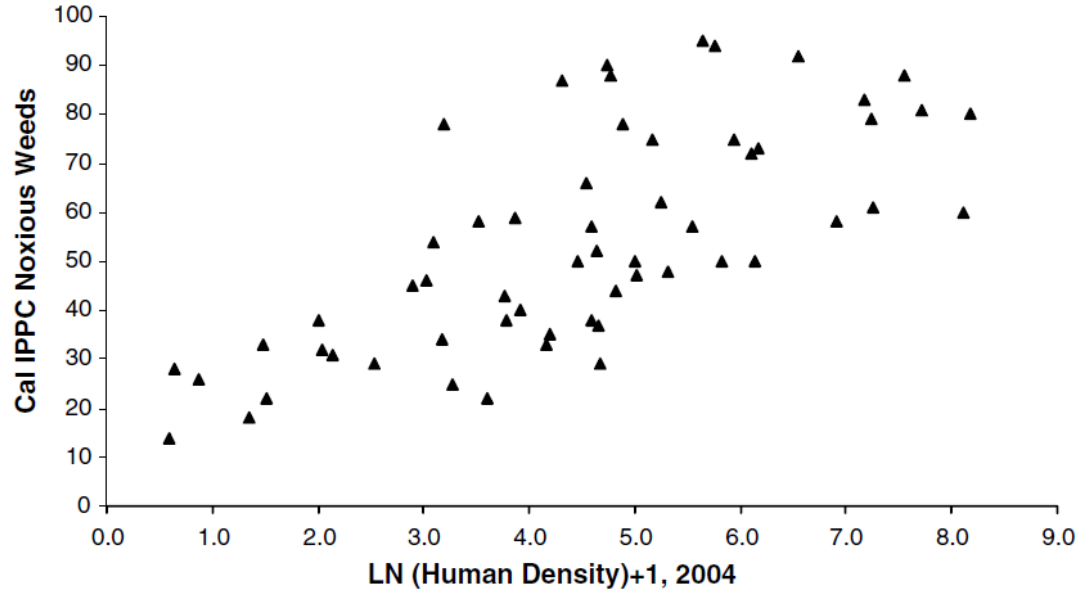
1. Contribute genetic diversity and adaptation to climate change



1. Enable engagement and stewardship

IS Removal in cities may matter much more than we think

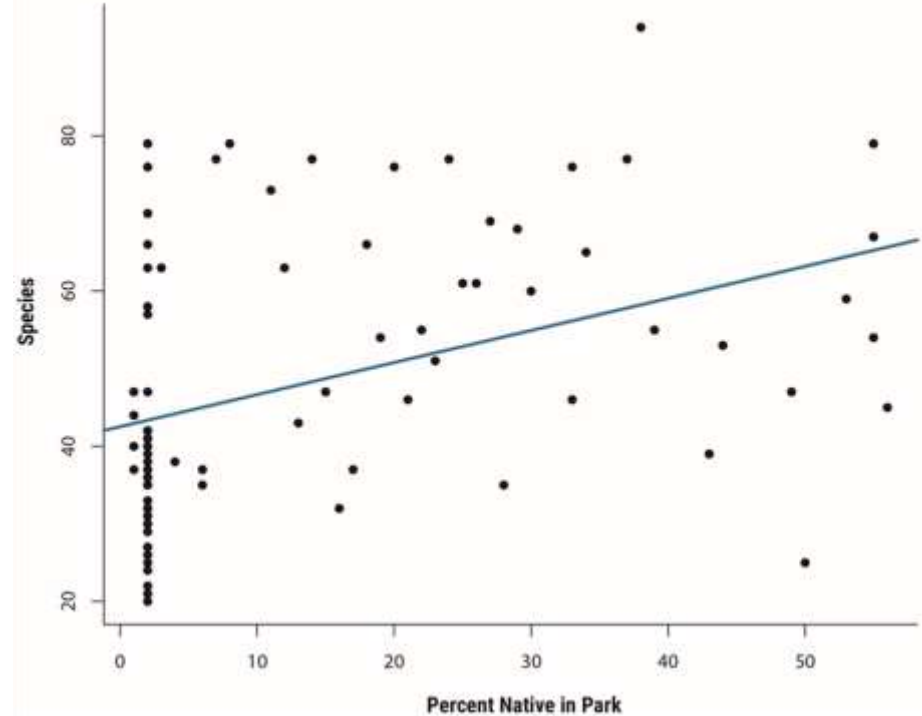
Of 962 list 1 plant species, 48% are restricted to the 34 counties with **high and medium population density**



Schwartz, M., J. Thorne, J. Viers 2006. **Biotic homogenization of the California flora in urban and urbanizing regions.** Biological Conservation.

Native plants and habitat matter in cities

Birds respond to
**large patches and
native cover** in
urban parks in
Santa Clara County







Riparian willow habitat



Rottenborn, S. 1999. **Predicting the impacts of urbanization on riparian bird communities.**
Biological Conservation.

IS Threats: Riparian willow habitat



A topographic map of a coastal region, likely in California, showing the coastline and inland terrain. Two green location pins are placed on the map. The first pin is located near a large body of water, and the second pin is located further inland, near a smaller body of water. The map is overlaid with a semi-transparent white box containing the text "Sausal creek daylighting".

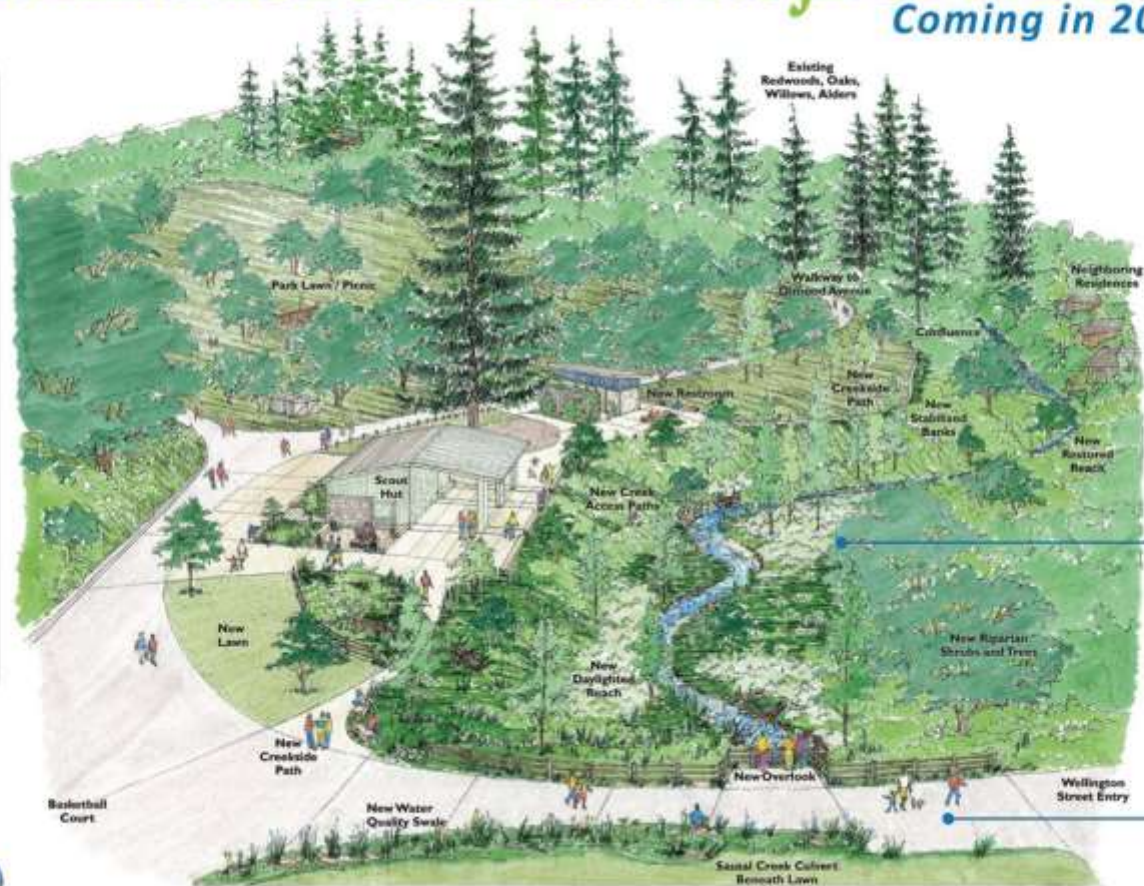
Sausal creek daylighting

Charleston retention basin

SAUSAL CREEK RESTORATION PROJECT in DIMOND PARK

Coming in 2015

Project Plan View



Key Project Objectives

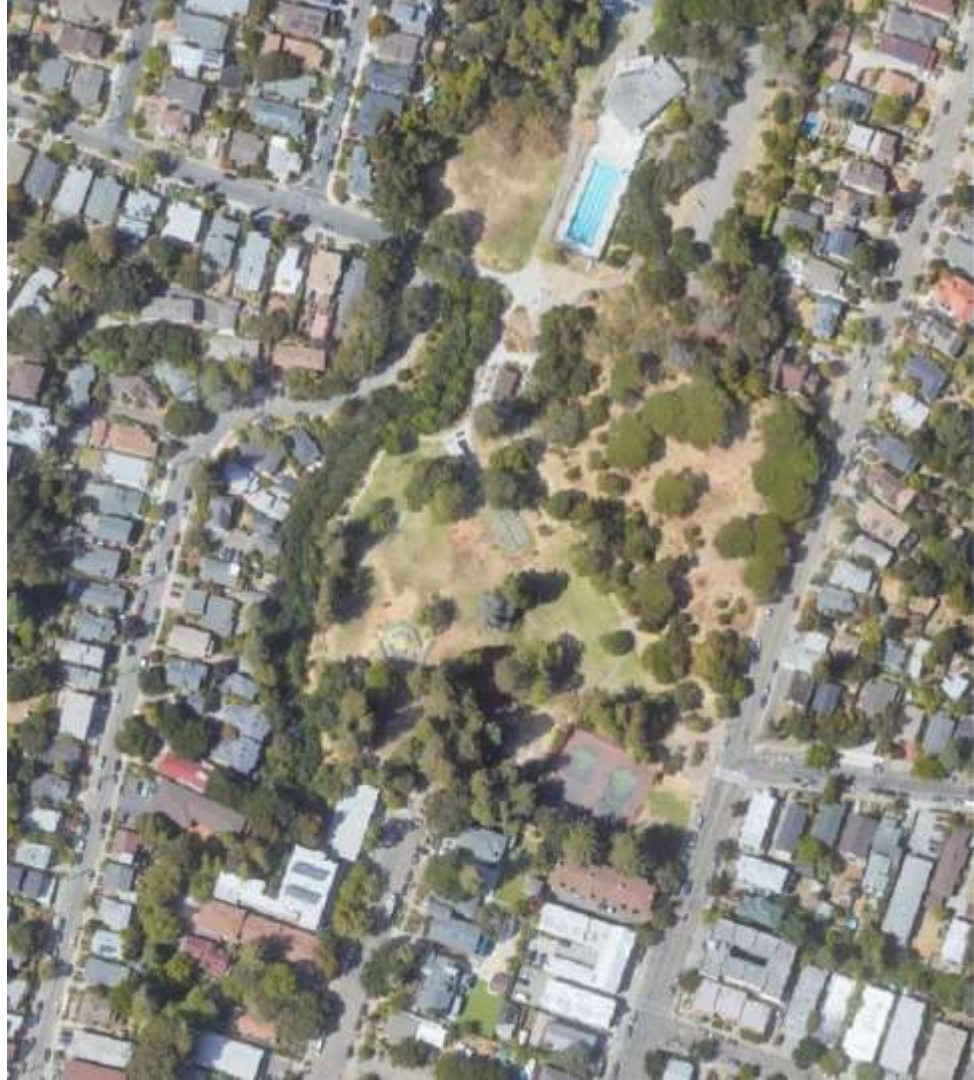
- Daylight buried reach of Sausal Creek
- Restore the lower reach of Sausal Creek
- Enhance flood control capacity
- Improve creek stability and public safety
- Restore native trout habitat and fish passage
- Improve water quality and create new wildlife habitat
- Build new restroom facility
- Create creekside pathways

Historical Photographs - 1952



For more information about the Sausal Creek Restoration Project, visit www.oaklandcreeks.org

Sausal creek daylighting



Riparian willow habitat



Western Tiger Swallowtail
(*Papilio rutulus*)

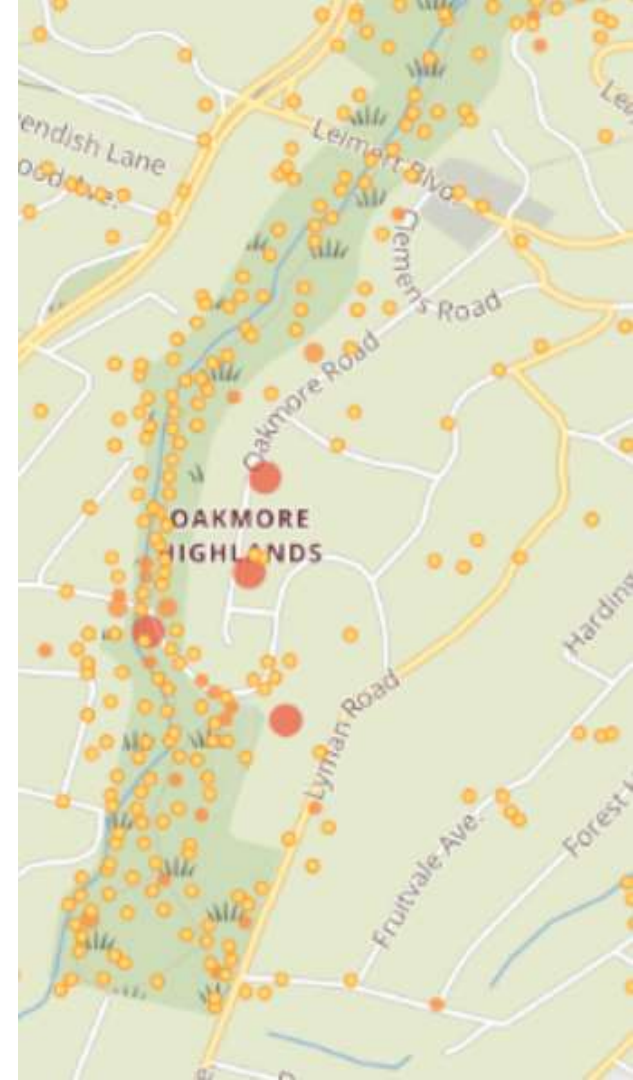


Arboreal Salamander
(*Desmognathus fuscescens*)



Southern Alligator Lizard
(*Zootoca blanchardi*)

458 species



Charleston retention basin



Charleston retention basin

224 species



1 observation
CC

Vivid Dancer
(*Zygia viridis*)



1 observation
CC

Pacific Forktail
(*Ischnura elegans*)



4 observations
CC

Willow Apple Gall Saw...
(*Empoasca fabae*)



1 observation
CC

Western Tiger Swallow...
(*Papilio rutulus*)



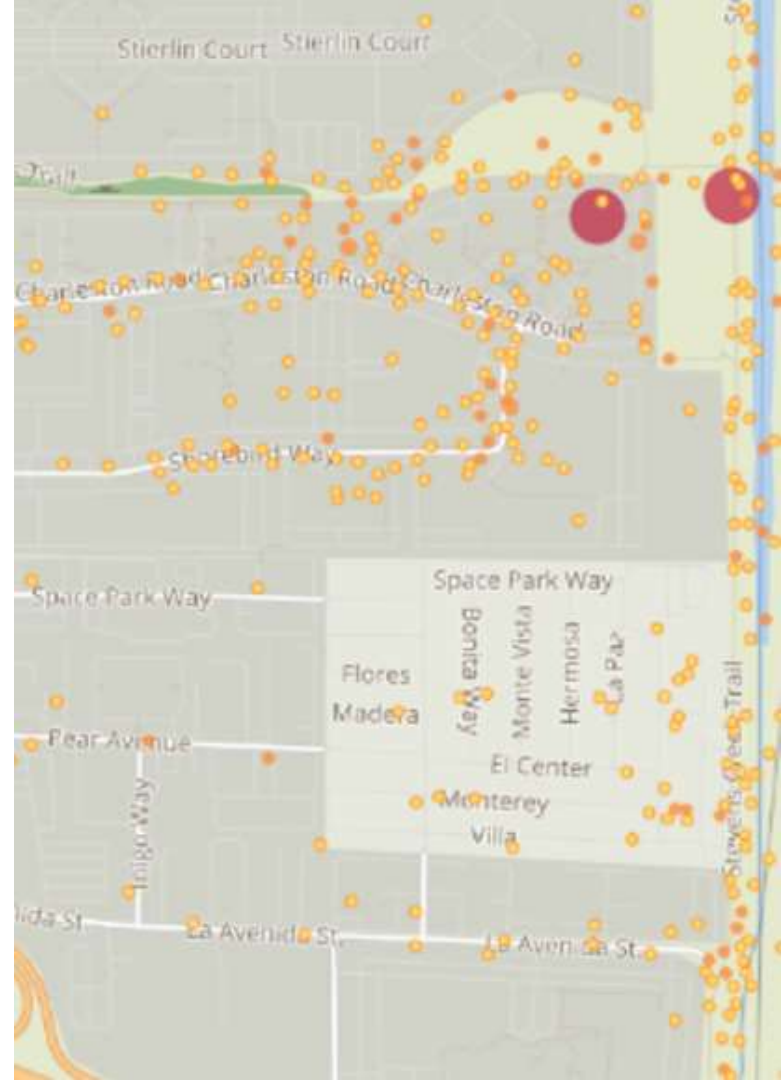
3 observations
CC

Arboreal Salamander
(*Desmognathus fuscescens*)



1 observation
CC

Southern Alligator Liza...
(*Elgaria multicarinata*)



Wildflower meadows



Wildflower meadow habitat



SoCal Restored
wildflower meadows
with Lupin and other
wildflowers

(Luong et al. 2019)



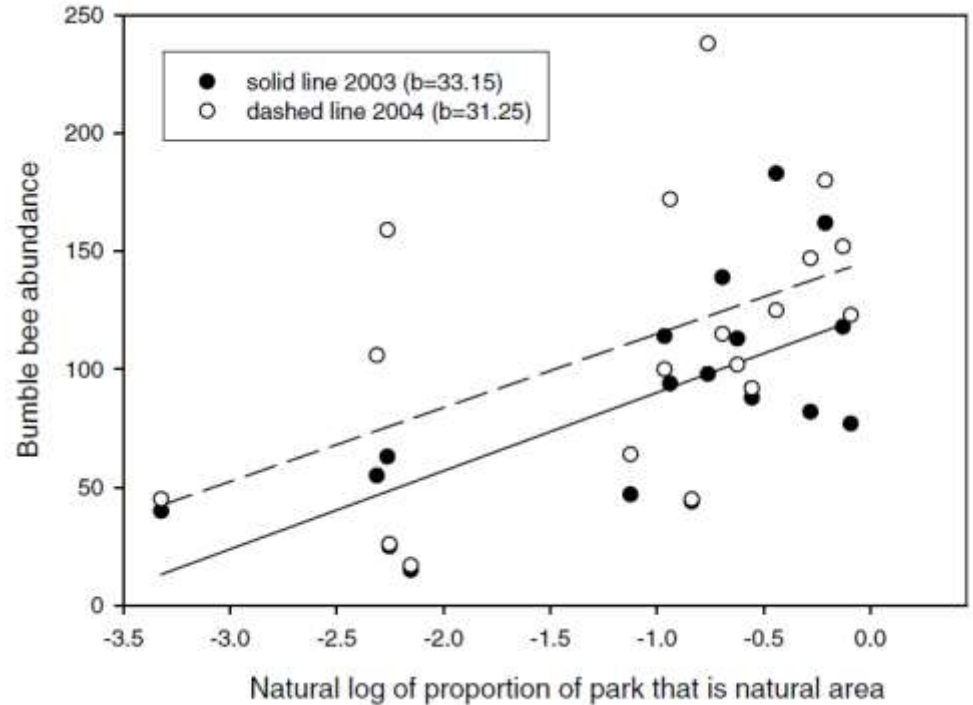
Native milkweeds and
wildflowers

(Dilts et al. 2019, Crone & Schultz 2021)



SF Urban parks with
natural areas and
Ceanothus thyrsifolius

(McFrederick & LeBuhn 2006)



Wildflower meadow habitat

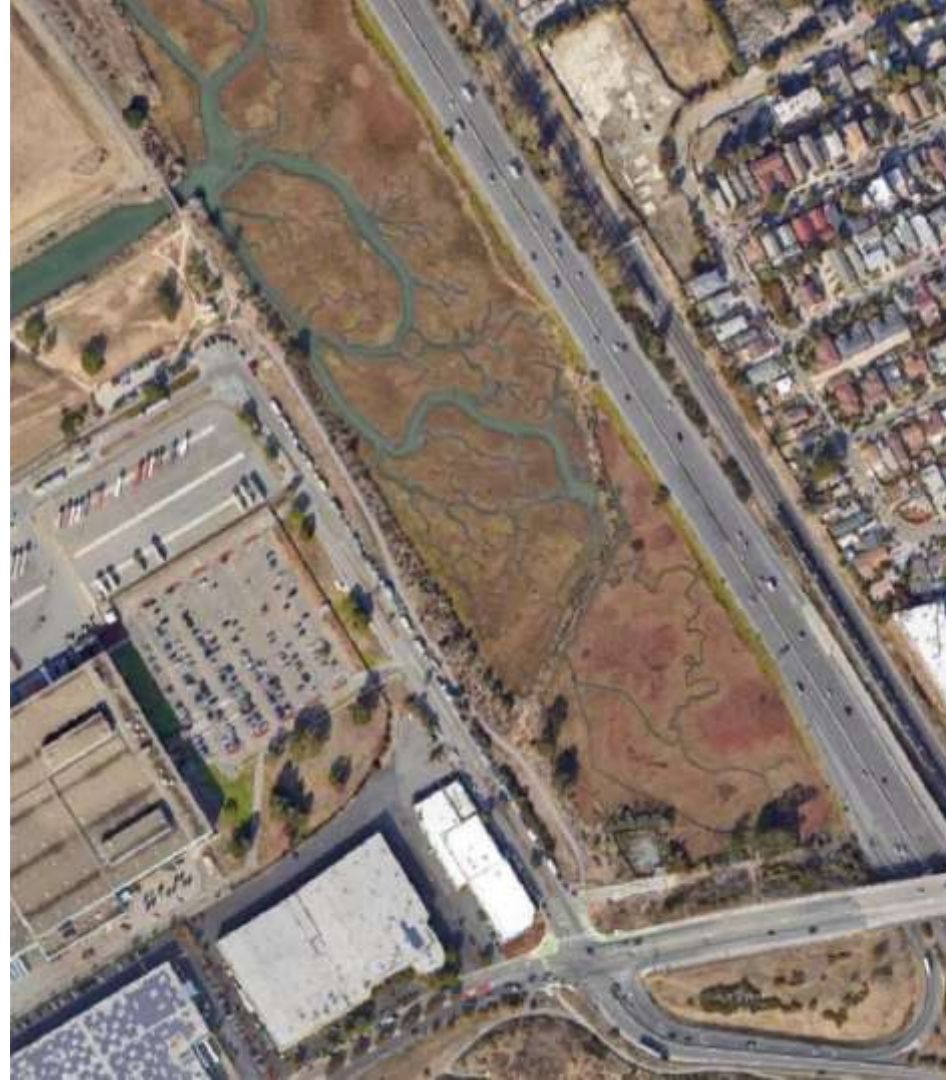




CNPS Pt. Isabel



Wildflower meadows at Google



CNPS Restoration Pt. Isabel



Monarch
(*Danaus plexippus*)



Gulf Fritillary
(*Dione vanillae*)



West Coast Lady
(*Vanessa annabella*)



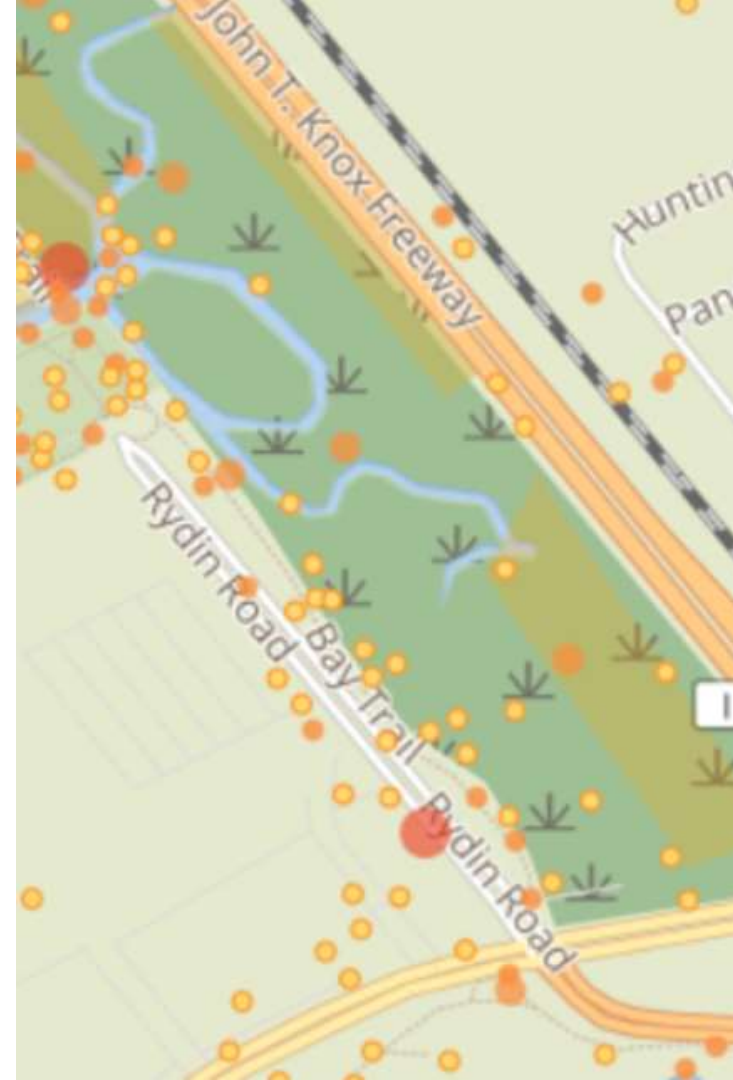
Lorquin's Admiral
(*Limenitis lorquini*)



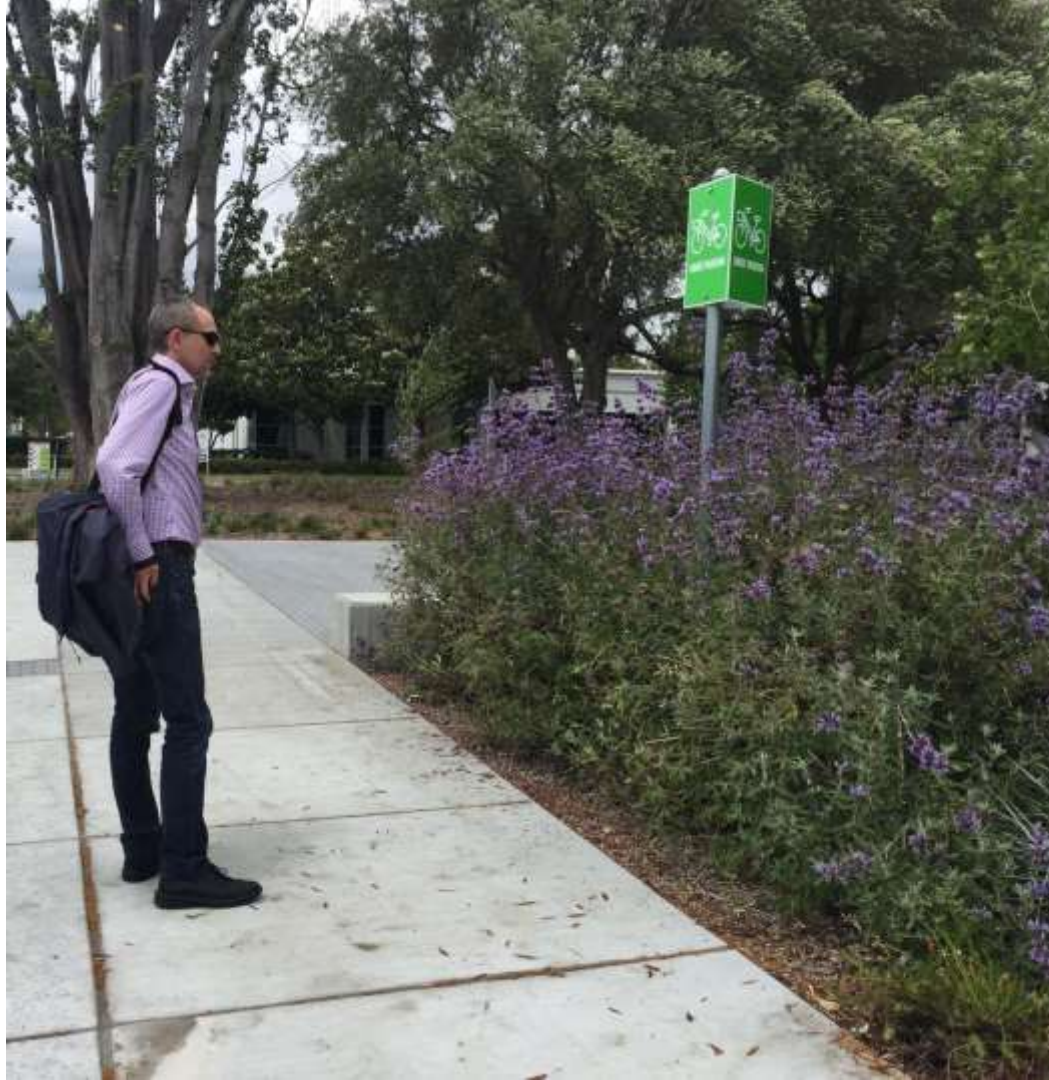
California Bumble Bee
(*Bombus californicus*)



Yellow-faced Bumble B...
(*Bombus vosnesenskii*)







Wildflower meadows at Google



Monarch
(*Danaus plexippus*)



Painted Lady
(*Vanessa cardui*)



Red Admiral
(*Vanessa atalanta*)



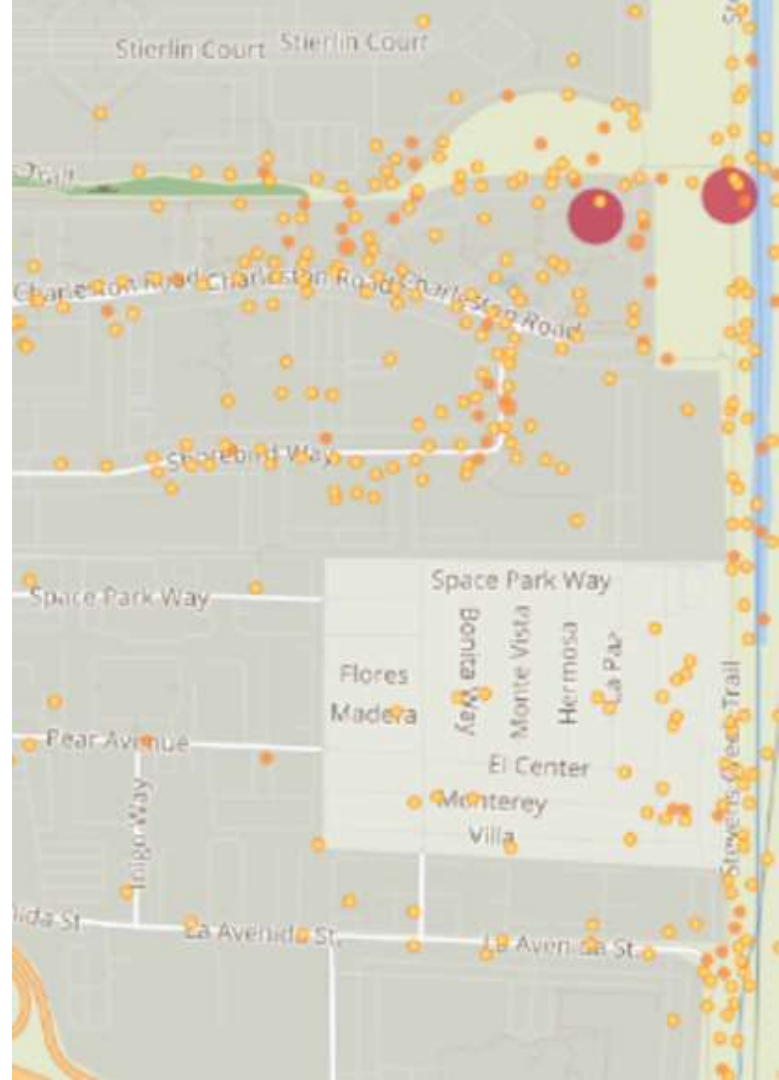
Black-tailed Bumble Bee
(*Bombus melanopygus*)



Yellow-faced Bumble B...
(*Bombus vosnesenskii*)



Mourning Cloak
(*Nymphalis antiopa*)



Conclusions

- Urban biodiversity is very responsive to local habitat conditions
- Potential for urban biodiversity conservation is much larger than we think
- IS management is an important tool in the toolbox, even in urban landscapes

Thank You

